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IS 447 (1988): Rubber hose for welding [PCD 13: Rubber and Rubber Products]

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**IS : 447 - 1988**

*Indian Standard*

**SPECIFICATION FOR  
RUBBER HOSE FOR WELDING**  
*( Fourth Revision )*

**( Reaffirmed 2003 )**

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**BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002**

*Indian Standard*

# SPECIFICATION FOR RUBBER HOSE FOR WELDING

## ( Fourth Revision )

### 0. FOREWORD

**0.1** This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards on 9 November 1988, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

**0.2** This standard was originally published in 1953 and subsequently revised in 1964 (first revision), 1968 (second revision) and 1980 (third revision). The third revision was an amalgamated revision of IS : 447-1968\* and IS : 3572-1968† covering both the woven and braided constructions.

\*Specification for welding hose of rubber with woven textile reinforcement (*second revision*).

†Specification for welding hose of rubber with braided textile reinforcement (*first revision*).

**0.3** In this fourth revision, the requirements for adhesion strength, elongation at break and increase in outside diameter at working pressure have been modified and all other changes necessary to align this standard with others in this series of standards on hoses have been introduced.

**0.4** This standard contains clauses 3.1.2 and 3.2.3 which call for agreement between the purchaser and the supplier.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

\*Rules for rounding off numerical values (*revised*).

### 1. SCOPE

**1.1** This standard prescribes the requirements, methods of sampling and test for rubber hose for welding. These hoses are designed for a working pressure up to 1.25 MPa\*.

### 2. TERMINOLOGY

**2.1** For the purpose of this standard, the definitions given in various parts of IS : 7503† shall apply.

### 3. REQUIREMENTS

#### 3.1 Construction

**3.1.1 Lining** — A rubber inner lining, smooth in bore.

**3.1.2 Reinforcement** — A reinforcement of natural or synthetic fibres applied by a suitable technique.

**Note** — The purchaser, while placing the order, shall specify the type of reinforcement required by him.

**3.1.3 Cover** — A rubber cover, smooth, or fluted or may have a fabric marked finish.

The lining and the cover of the hose shall be uniform in thickness, reasonably concentric and free from air blisters, porosity and splits.

**3.1.3.1** The colour of the cover shall be as follows:

- a) Red for hose for fuel gases, and
- b) Blue for hose for oxygen and other non-combustible gases.

#### 3.2 Dimensions and Tolerances

**3.2.1 Bore Size** — The bore size when measured according to the method prescribed in 4.2.1.2 of IS : 443-1975\*, shall be as given in Table 1.

**3.2.2 Lining and Cover Thickness** — The thickness of lining and cover of the hose when determined according to 4.2.2 of IS : 443-1975\* shall not be less than that specified in Table 1.

**3.2.3 Length** — The minimum nominal length of the hose shall be 15 metres. The moulded hoses may be supplied in longer lengths as agreed to between the purchaser and the supplier.

\*1MPa = 1MN/m<sup>2</sup> = 10.2 kgf/cm<sup>2</sup>.

†Glossary of terms used in rubber industry.

\*Methods of sampling and test for rubber hoses (*second revision*).

**3.2.3.1** The tolerance on any specified hose length shall be  $\pm 1$  percent.

### 3.3 Physical Requirements

**3.3.1** The requirements of physical tests on finished hose shall be as given in Table 2.

### 3.4 Performance Requirements

**3.4.1** The performance requirements for finished hose shall be as given in Table 3.

## 4. MARKING

**4.1** Each length of hose shall be indelibly marked adjacent to each end with:

- a) Manufacturer's name or trade mark, and hose denomination; and

b) Month and year of manufacture, if required by the purchaser.

**4.1.1** Each length of hose may also be marked with the Standard Mark.

**NOTE** — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1963 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

**TABLE 1 NOMINAL BORE SIZE AND TOLERANCE ON NOMINAL BORE SIZE AND MINIMUM THICKNESS OF LINING AND COVER**

(Clauses 3.2.1 and 3.2.2)

Sl No.	NOMINAL BORE SIZE mm	TOLERANCE ON NOMINAL BORE SIZE mm	MINIMUM THICKNESS	
			Lining mm	Cover mm
(1)	(2)	(3)	(4)	(5)
i)	5.0	$\pm 0.75$	1.5	1.0
ii)	6.3	$\pm 0.75$	1.5	1.0
iii)	8.0	$\pm 0.75$	1.5	1.0
iv)	10.0	$\pm 0.75$	1.5	1.0
v)	12.5	$\pm 0.75$	1.5	1.5

**NOTE** — In the case of fluted hose, the cover thickness shall correspond to the measurement made at a point where the thickness of fluting is included therein.

**TABLE 2 PHYSICAL REQUIREMENTS**

(Clause 3.3.1)

Sl No.	CHARACTERISTIC	REQUIREMENT	TEST SPECIMEN	METHOD OF TEST, REF TO CLAUSE No. OF IS : 443-1975*	
(1)	(2)	(3)	(4)	(5)	
i)	Tensile strength, MPa, Min		Test piece cut from hose	5	
	a) Lining	5.0			
	b) Cover	7.0			
ii)	Elongation at break, percent, Min		Test piece cut from hose	5	
	a) Lining	200			
	b) Cover	300			
iii)	Accelerated ageing, lining and cover		Test piece cut from hose	6	
	a) Change in tensile strength, percent of the original value, Max	$\pm 25$		for 70 + 2 h at $70 \pm 1^\circ\text{C}$	
	b) Change in elongation at break, percent of the original value	+10 -30		for 6 for 70 + 2 h at $70 \pm 1^\circ\text{C}$	

\*Methods of sampling and test for rubber hoses (second revision).

## 5. SAMPLING AND CRITERIA FOR CONFORMITY

5.1 For the purpose of ascertaining the conformity of the hose in a consignment to this specification, the scale of sampling and criteria for conformity shall be as prescribed in 3 of IS : 443-1975\*.

\*Methods of sampling and test for rubber hoses (*second revision*).

## 6. TIME LAPSE BETWEEN RECEIPT OF MATERIAL AND TESTING

6.1 For all test purposes, the minimum time between vulcanization and testing shall be 16 h.

6.1.1 For product tests, whenever possible, the time between vulcanization and testing should not exceed 4 months. In other cases, the tests shall be made within 2 months from the date of receipt of the product by the customer.

TABLE 3 PERFORMANCE REQUIREMENTS

(Clause 3.4.1)

SL. No.	CHARACTERISTIC	REQUIREMENT	TEST SPECIMEN	METHOD OF TEST, REF TO
(1)	(2)	(3)	(4)	(5)
i)	Hydrostatic test pressure of 2.5 MPa for one minute	No leakage or other sign of weakness	Full length of hose	8.3 of IS : 443-1975*
ii)	Burst pressure, MPa, Min	5.0	Short length cut from hose	8.2 of IS : 443-1975*
iii)	Increase in outside diameter at working pressure, percent, Max	+15 - 5	Full length of hose	8.5 of IS : 443-1975*
iv)	Change in length at proof pressure, percent, Max	$\pm 12$	Full length of hose	8.4 of IS : 443-1975*
v)	Adhesion between components: a) Lining to reinforcement b) Between reinforcements c) Reinforcement to outer cover by Machine method, kPa, Min	1.5	Test piece cut from the hose	IS : 3400 (Part 5)-1986†

NOTE — Tests at Sl No. (i) and (ii) should be carried out at the factory. If the hose is offered at places other than the factory, the manufacturer's certificate should be accepted.

\*Methods of sampling and tests for rubber hoses (*second revision*).

†Methods of sampling and test for vulcanized rubbers: Part 5 Adhesion of rubbers to textile fabric (*second revision*).

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## **BUREAU OF INDIAN STANDARDS**

### **Headquarters :**

**Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002**  
**Telephones : 331 01 31, 331 13 75**

**Telegrams : Manaksantha**  
**( Common to all Offices )**

### **Regional Offices :**

**Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg**  
**NEW DELHI 110002**

**{ 331 01 31**  
**{ 331 13 75**

**Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola**  
**CALCUTTA 700054**

**37 86 62**

**Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036**

**53 38 43**

**Southern : C.I.T. Campus, IV Cross Road, MADRAS 600113**

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FOR WELDING**

**( *Fourth Revision* )**

[ *Page 3, Table 3, Sl No. (v)(c), column 2* ] — Substitute 'kN/m width' for  
'kPa'.

**( PCD 13 )**

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**Reprography Unit, BIS, New Delhi, India**